

Section 16 – Appendices

Appendix A: Mission Vision and Goals

Policy Statement

Asset Management is the business model for informing all resource allocation decision-making related to the transportation infrastructure. SDOT's statement of principles describes the mature asset management environment it is working toward.

Vision

Seattle Department of Transportation will set the standard for transportation agencies in asset management

Mission

To inform transportation resource allocation decisions through expert, credible, and responsive asset management

Goals

SDOT will achieve Sustainability over the lifecycle of the transportation infrastructure

SDOT will practice Accountability to the citizens of the city of Seattle in its stewardship of the transportation infrastructure

SDOT resource allocations will reflect Transparency so that decisions are easily communicated and understandable

Background

In 2007, Seattle Department of Transportation began implementation of asset management, a strategic and systematic process that guides decisions about construction, maintenance and operation of SDOT infrastructure. The department operated with a policy framework published as the asset management manifesto. This document included fifteen principles that were described as statements of intent to achieve an "end-state", meaning that the principles defined a fully mature asset management environment. SDOT is now restating its vision, mission, goals and objectives for asset management. The principles have been updated to reflect three years of progress and re-emphasis for the Department's future direction in asset management.

The updated statement of principles follows:

- **Asset Inventory.** SDOT will develop information on our asset inventories that will include all those assets that we are responsible for and will be ordered according to a hierarchy that reflects SDOT's business responsibilities and advanced asset management practices.
- **Condition Assessment.** SDOT will collect information on the condition of our assets that will be consistent and easily understood across all the categories of our assets. This information will be used to develop asset management plans for the maintenance and operation of our assets that will achieve sustainable service levels. Condition assessments will occur on a frequency that meets all business and reporting needs.
- **Maintenance.** SDOT will develop and adopt a maintenance and preservation policy for our assets that moves us toward an operation that achieves sustainable and high levels of performance based on agreed upon service levels. This policy will be assisted in its implementation by the development and use of a work management system that will work in cooperation with AM practices to retain necessary maintenance and condition information.

- Levels of Service (LOS). SDOT will develop level of service information that reflects and includes to the extent feasible our customer and stakeholder input. We will use this information to report on our performance in meeting, or not meeting, the LOS and the implications thereof.
- Financial Planning. SDOT will incorporate full life-cycle costing into our financial planning to achieve cost-effective asset management planning and operation to minimize full life-cycle costs. Our financial reporting will reflect full lifecycle costing, and will include the implications of meeting, or failing to meet the funding requirements indicated by full life-cycle costing.
- CIP and Annual Budget Funding Processes and Procedures. SDOT will incorporate asset management principles into budgeting and CIP decision-making, across the Department so that decisions are based on critical asset needs, conditions, and levels of service.
- Capital Improvement Planning. SDOT capital planning for replacement, renewal or new infrastructure will include asset management principles related to LOS, full life-cycle costing and an understanding of the criticality of the asset and its sustainable service levels.
- Information Technologies and Management. SDOT will adhere to its integrated systems strategy in developing information systems that support the business and user needs of Asset Management; be they inventory, condition, work management, financial, or project planning systems. Asset information is an essential but expensive foundation for effective Asset Management decisions. Our information management practices will ensure that we collect and actively maintain only the critical minimum information at the level of quality needed by the business, and that this information is accessible from authoritative sources (for example, pavement management, structures database, Bridge Works, and the Hansen system). SDOT will follow knowledge management practices to standardize and disseminate asset management data and practices across the organization.
- Reporting. SDOT will report on its performance in relation to an annual strategic asset management plan and report, and in asset status and condition reports.
- Triple-bottom line. SDOT will align the environmental and social costs and impacts of asset decisions with the City's policy as embodied in its Race and Social Justice Initiative.

Appendix B: The Asset Hierarchy

The hundreds of transportation infrastructure components owned by SDOT have been organized into a hierarchy to enable more effective management and communication about the assets. This table depicts the hierarchy down to the level 2 assets to more clearly communicate the nature of each level 1 asset discussed in this report. Many of these level 1 assets can be decomposed to even lower levels. Further details about the SDOT Asset Hierarchy can be provided by contacting the SDOT Asset Management Program staff.

Asset Class	Level 1 Assets	Level 2 Assets	Asset Categories
Bike/Ped System	Bicycle Rack		
	Marked Crosswalk		Raised, Painted, Torch-down, Thermoplastic
	Pedestrian Crossing Underpass/Tunnel		
	Pedestrian Viewing Platform		
	Sidewalk System	Sidewalk	Block, Improved Corner
		Curb	
		Curb Ramp	
		Improved Filler	
	Stairway	Rail	
		Rail Post	
		Tread	
		Riser	
		Landing	
		Stringer/Support	
		Cleat	
	Trail	Trail Surface	Paved, Gravel/Dirt
		Bollard	
	Transit Loading Platform		Bus Island, Streetcar Platform
Channelization	Pavement Marking		Pavement Delineators, Legends, Hatchings, Stop Lines, Parking Space, Curb Markings
	Roundabout		
Intelligent Traffic Signs	Dynamic Message Sign	Display Panel	
		Controller Cabinet	
		Communication Equipment	
	Radar Speed Sign		

Asset Class	Level 1 Assets	Level 2 Assets	Asset Categories
Parking Payment Devices	Pay Station	Pay Station Body	
		Mother Board	
		Display	
		Card Reader	
		Button Board	
		Coin Box	
		EPROM	
		Printer	
		Coin Acceptor	
		Pay Station Sign	
	Parking Meter	Meter Head	
		Meter Pole	
Pavement System	Pavement		Arterials, Non-Arterials, Alleys, Excess ROW in use for access & parking
Real Property	Building		
	Excess/Unopened ROW in Public Use		
	Parcel		Former Railroad ROW, Other Real Estate
Regulated Assets	Areaway	Beams	
		Building Wall	
		Deck/Sidewalk	
		End Walls	
		Floor	
		Skylight	
	Shoreline Street End		
	Unimproved Filler		Shoulder, Planting Strip, Other
	Unopened ROW		
Roadway Structures	Areaway Street Wall		
	Bridge	Superstructure	
		Substructure	
		Approach Slab	
		Machinery	
		Control System	
		Protection Pier	
	Bridge Hydrant Vault		
	Retaining Wall	Railing	
		Drainage	
		Tie Back	
		Lagging	
		Pile	
		Expansion Joint	
		Whaler	
		Structural Face	

Asset Class	Level 1 Assets	Level 2 Assets	Asset Categories
Seattle Streetcar	Streetcar System	Streetcar	
		Paved Trackway	
		Streetcar Station Shelter	
		Traction Power System	
		Train-to-Wayside Communication System	
		Passenger Information System	
Signs	Sign Assembly	Sign	Regulatory, Warning, Directional/Guide, Temporary
		Mount	
Structures Other Than Roadway	Air Raid Siren Tower		
	Pier		
Traffic Safety Structures & Devices	Chicane		
	Crash Cushion		
	Curb Bulb		
	Delineator Post		
	Guardrail	Rail	
		Post	
	Median Island	Median Island Curb	Paved or Landscaped; Pedestrian Refuge Island or Other
		Raised Asphalt Interior	
		Fencing	
	Speed Cushion		
	Speed Dot		
	Speed Hump		
	Traffic Circle		

Asset Class	Level 1 Assets	Level 2 Assets	Asset Categories
Traffic Signal System	Beacon		School, Traffic, Emergency/Warning,
	Camera Assembly	CCTV Camera	
		CCTV Camera Cabinet	
		CCTV Camera Mount	
		CCTV Panel	
		CCTV Camera Power & Video Cables	
	Traffic Management Center	Modems	
		Video Multiplexor	
		Port Server	
		File Server	
		Work Station	
		Video Wall Screen	
		Video Switch	
		Video Encoder/Decoder	
		Switch	
		Firewall	
	Traffic Signal Assembly	Controller Cabinet	
		Overhead Assembly	
		Vehicle Signal Head Assembly	
		Pedestrian Signal Head Assembly	
		Electrical Sign	
	Traffic Signal Communication System	Terminal Cabinet	Copper, Fiber
		Interconnect	
Urban Forest	Landscaped Area	Plant Material	
		Irrigation System	
		Soil	
	Tree	Tree Specimen	
		Tree Pit	

Appendix C: Condition Ratings and Asset Condition Criteria

Overview:

A consistent measure of condition ratings is used throughout SDOT: Good, Fair, and Poor. While these condition ratings carry the same meaning for all assets, the criteria used for establishing the condition rating is different for each asset.

This appendix documents the condition criteria for each level 1 asset and is listed alphabetically by asset class.

Condition Criteria for Level 1 Assets:

Asset Class: *Bicycle and Pedestrian System:*

Asset :	<i>Bicycle Rack</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Structure	Able to maintain full bike capacity	Unable to accommodate full capacity of bicycles	Unable to accommodate bicycles
Attachment to ground	Fully connected to surface	Connection to surface loose but maintained	Connection to surface lost
Age	0-15 years old	16-20 years old	> 20 years old
Summary:	Asset is rated at the lowest condition rating for any of the essential characteristics		

Asset :	<i>Marked Crosswalk (Painted, Torch-down, Thermoplastic)</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Percent of original marking visible	75-100%		< 75%
Age	0-4 years old	5-7 years old	> 7 years old
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Marked Crosswalk (Raised)</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Percent of original marking visible	75-100%		< 75%
Integrity of facility	As new		No longer as new
Age	0-30 years old	31-40 years old	> 40 years old
Summary:	Asset is rated at the lowest condition rating for any of the essential characteristics		

Asset :	<i>Stairway</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Structural Rating	Near original condition with no age deterioration, wear and tear or safety issues. The site condition has not changed.	Minor to moderate age deterioration, wear and tear, or safety issues may be present. Incipient site condition changes from the original condition.	Moderate to severe age deterioration, wear and tear, or safety issues are present.
Summary:			

Asset :	<i>Trail</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Pavement distress	No visible distress	Some visible distress	Significant visible distress
Bollards	Effectively deter motor vehicles from entering when enabled		Removed or unable to deter motor vehicle traffic
Age	0-7 years old if gravel 0-15 years old if asphalt	8-10 years old if gravel 16-20 years old if asphalt	> 10 years old if gravel > 20 years old if concrete
Summary:	Asset is rated at the lowest condition rating for any of the essential characteristics		

Asset :	<i>Transit Loading Platform</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Integrity of facility	As new		No longer as new
Age	0-15 years old if asphalt 0-30 years old if concrete	16-20 years old if asphalt 31-40 years old if concrete	> 20 years old if asphalt > 40 years old if concrete
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset Class: Channelization

Asset :	<i>Pavement Marking (Pavement Delineator – Arterial)</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Percent of original marking visible	75-100%		< 75%
Age	< 1 year old		> 1 year old
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Pavement Marking (Pavement Delineator – Other)</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Percent of original marking visible	75-100%		< 75%
Age	1-3 years old	4-5 years old	> 5 years old
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Pavement Marking (Legends – Bicycle Lane and Pedestrian)</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Percent of original marking visible	75-100%		< 75%
Age	1-2 years	3 years old	> 3 years old
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Pavement Marking (Legends – Channelization, Sharrows, and Stop Bar)</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Percent of original marking visible	75-100%		< 75%
Age	1-7 years old	8-10 years old	> 10 years old
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Trail</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Pavement distress	No visible distress	Some visible distress	Significant visible distress
Bollards	Effectively deter motor vehicles from entering when enabled		Removed or unable to deter motor vehicle traffic
Age	0-7 years old if gravel 0-15 years old if asphalt	8-10 years old if gravel 16-20 years old if asphalt	> 10 years old if gravel > 20 years old if concrete
Summary:	Asset is rated at the lowest condition rating for any of the essential characteristics		

Asset Class: Intelligent Traffic Signs

Asset :	<i>Dynamic Message Sign</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Physical Condition	Meets current engineering design standards, has no visible damage or deterioration, has 75% or more of its useful life remaining	Meets current engineering design standards, may have some damage that does not affect its integrity, has 50-74% of its useful life remaining	Does not meet current design standards, or has substantial damage or deterioration that requires it to have major upgrade or replacement of components, has less than 20% of its useful life remaining
Operational Condition	Meets current engineering operational needs and standards, is functional 24/7 except during scheduled power outages	Is functional 24/7 but has limited operational capabilities, not able to meet all of the desired needs of the system	Does not meet current operational needs, over capacity or malfunctioning due to component failures
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Radar Speed Sign</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Physical Condition	Meets current engineering design standards, has no visible damage or deterioration, has 75% or more of its useful life remaining	Meets current engineering design standards, may have some damage that does not affect its integrity, has 50-74% of its useful life remaining	Does not meet current design standards, or has substantial damage or deterioration that requires it to have major upgrade or replacement of components, has less than 20% of its useful life remaining
Operational Condition	Meets current engineering operational needs and standards, is functional 24/7 except during scheduled power outages	Is functional 24/7 but has limited operational capabilities, not able to meet all of the desired needs of the system	Does not meet current operational needs, over capacity or malfunctioning due to component failures
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset Class: Parking Payment Devices

Asset : <i>Pay Station</i>				
Essential Characteristic	Rating			
	Good	Fair	Poor	
Vendor support	All parts and systems supported by vendor at warranty standards or competitive replacement costs		Parts and system no longer supported by vendor at warranty standards or competitive replacement costs	
Technology condition	<p>Parking payment: collects parking fees effectively and efficiently, credit cards and credit card systems are in common</p> <p>Revenue collection: credit card processing and coin counting/deposit practices efficiently and economically support system.</p> <p>Communications system: online conductivity meets or exceeds 98.5% uptime.</p> <p>Data security: meets or exceeds annual Visa and MasterCard audit standards.</p> <p>Reporting and alarms system: meets or exceeds City requirements and is fully supported by vendor.</p> <p>Parking rate & policy change system requirements: fully supported by both vendor systems and City O&M budget.</p>		<p>Parking payment: does not collect parking fees effectively and efficiently, parking fees exceed practical coin payment amounts, credit card technology changes require major equipment retrofit, other payment processes replace current systems.</p> <p>Revenue collection: credit card processing and coin counting/ deposit practices do not efficiently and economically support system.</p> <p>Communications system: online conductivity is less than 98.5% uptime.</p> <p>Data security: does not meet annual Visa and MasterCard audit standards.</p> <p>Reporting and alarms system: does not meet City requirements to maintain system operational efficiency and/or is no longer fully supported by vendor.</p> <p>Parking rate & policy change system requirements: not fully supported by vendor systems and/or City O&M budget.</p>	
Physical condition and appearance	Color and appearance is uniform and smooth with few if any dents, abrasions, scrapes or other physical deformities. Labels are legible and smooth		Sun-faded and exterior plastic is cracked, or exterior is damaged to the extent that repair costs equal replacement and recondition costs	
Summary:	Asset is rated at the lowest condition rating for any of the essential characteristics			

Asset :	<i>Parking Meter</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Vendor support	All parts and systems supported by vendor at warranty standards or competitive replacement costs		Parts and systems no longer supported by vendor at warranty standards or competitive replacement costs
Technology condition	Parking payment: collects parking fees in an effective and efficient manner. Revenue collection: coin counting/deposit practices efficiently and economically support system. Parking rate & policy change system requirements: fully supported by both vendor systems and City O&M budget.		Parking payment: does not collect parking fees in an effective and efficient manner, parking fees exceed practical coin payment amounts, other payment processes replace current systems. Revenue collection: coin counting/deposit practices do not efficiently and economically support system. Parking rate & policy change system requirements: not fully supported by vendor systems and/or City O&M budget.
Physical condition and appearance	Parking meter housing, visible interior mechanism and labels, and support pole appearance is uniform, smooth and legible, with few if any dents, abrasions, scrapes or other physical deformities	≥ 7.5 years old	Parking meter housing, visible interior mechanism and labels, and support pole appearance is damaged to the extent that repair costs equal replacement and recondition costs
Summary:	Asset is rated at the lowest condition rating for any of the essential characteristics		

Asset Class: Pavement System

Asset :	<i>Pavement</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Pavement Condition Index (PCI)	56-100	41-55	0-40
Summary:			

Pavement Condition Rating Methodology:

Seattle currently uses the Metropolitan Transportation Commission (MTC) pavement management system software. The condition evaluation criteria used by MTC is based on the Pavement Condition Index (PCI) methodology developed by the U.S. Army Corps of Engineers, and is described in ASTM D 6433-03. The PCI procedure provides decision makers with a numerical value describing pavement condition. The value reflects both pavement structural integrity and operational surface condition. The rating procedure was designed to be repeatable and to correlate with the judgment of experienced pavement engineers.

The PCI method measures the occurrence of several pavement distress types and assigns a condition index based upon the density (area affected) and severity of the each different distress. The PCI is a number between 100 and 0. A PCI of 100 represents a pavement completely free of distress; a PCI of 0 corresponds to a pavement that has failed completely and can no longer be driven safely at the designed speed. A Pavement Condition Rating (PCR) is associated with ranges of PCI as shown below.

**Pavement Condition Ratings and Pavement Condition Index Ranges
Correlated to SDOT Condition Ratings**

Pavement Condition Rating (PCR)	Pavement Condition Index (PCI)	SDOT Condition Rating
Excellent	86-100	Good
Very Good	71-85	Good
Good	56-70	Good
Fair	41-55	Fair
Poor	26-40	Poor
Very Poor	11-25	Poor
Failed	0-10	Poor

Asset Class: Roadway Structures

Asset :	<i>Areaway Street Wall</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Structural face of the street wall	Near original condition with no signs of cracks and spalls. No signs of settlement or tilting.	Minor to moderate deterioration is present. Incipient cracks and spalls may be present. Wall may have small settlement or tilting.	Moderate to severe deterioration is present. Cracks and spalls are apparent. Tilting and/or settlement is apparent.
Sidewalk support (ceiling)	Near original condition with no signs of cracks, spalls, or section loss.	Minor to moderate deterioration is present. Incipient cracks, spalls, corrosion, rot with minor section loss may be present.	Moderate to severe deterioration is present. Wider cracks, spall with exposed rebar, corrosion or rot with significant section loss.
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	Bridge		
Essential Characteristic	Rating		
	Good	Fair	Poor
Sufficiency rating	81-100	51-80	0-50
Structurally deficient	No		Yes
Summary:	Structural deficiency carries the most weight. If a bridge is structurally deficient, the overall rating is poor. If the bridge is not structurally deficient, the sufficiency rating governs the overall condition of the bridge.		

Asset :	Retaining Wall		
Essential Characteristic	Rating		
	Good	Fair	Poor
Structural rating	0-24	25-50	70-100
Summary:			

Asset Class: Signs

Asset :	Sign Assembly		
Essential Characteristic	Rating		
	Good	Fair	Poor
Age (also a surrogate for clarity)	< 10 years old	10-12 years old	> 12 years old
Post	No visible damage		Damaged
Summary:	Age takes priority over post condition. If either characteristic is poor, the asset is rated as poor.		

Asset Class: Traffic Safety Structures & Devices

Asset :	Chicane		
Essential Characteristic	Rating		
	Good	Fair	Poor
Integrity of facility	As new		No longer as new
Age	0-15 years old	16-20 years old	> 20 years old
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	Crash Cushion		
Essential Characteristic	Rating		
	Good	Fair	Poor
Crash history	No crash history		Suffered a vehicular impact
Age	0-7 years old	8-10 years old	> 10 years old
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Curb Bulb</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Integrity of facility	As new		No longer as new
Age	0-15 years old if asphalt 0-30 years old if concrete	16-20 years old if asphalt 31-40 years old if concrete	> 20 years old if asphalt > 40 years old if concrete
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Guardrail</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Crash history	No crash history		Suffered a vehicular impact
Age	0-17 years old	17-25 years old	> 25 years old
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Median Island</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Integrity of facility	As new		No longer as new
Age	0-15 years old if asphalt 0-30 years old if concrete	16-20 years old if asphalt 31-40 years old if concrete	> 20 years old if asphalt > 40 years old if concrete
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Speed Cushion</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Bolt connection	Stable connection to the surface		Bolts disconnected or visibly loosened from roadway
Age	0-7 years old	8-10 years old	> 10 years old
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Speed Dot</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Integrity of facility	As new		No longer as new
Age	1-15 years old	16-20 years old	> 20 years old
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Speed Hump</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Integrity of facility	As new		No longer as new
Age	0-15 years old if asphalt 0-30 years old if concrete	16-20 years old if asphalt 31-40 years old if concrete	> 20 years old if asphalt > 40 years old if concrete
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Traffic Circle</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Integrity of facility	As new		No longer as new
Age	0-17 years old	17-25 years old	> 25 years old
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset Class: Traffic Signal System

Asset :	<i>Beacon</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Physical Condition	Meets current engineering design standards, has no visible damage or deterioration, has 75% or more of its useful life remaining	Meets current engineering design standards, may have some damage that does not affect its integrity, has 50-74% of its useful life remaining	Does not meet current design standards, or has substantial damage or deterioration that requires it to have major upgrade or replacement of components, has less than 20% of its useful life remaining
Operational Condition	Meets current engineering operational needs and standards, operates 100% of the scheduled time except during scheduled power outages	Is functional but has limited operational capabilities, not able to meet all of the desired needs of the system	Does not meet current operational needs, is obsolete, over capacity or malfunctioning due to component failures
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Camera Assembly</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Physical Condition	Meets current engineering design standards, has no visible damage or deterioration, has 75% or more of its useful life remaining	Meets current engineering design standards, may have some damage that does not affect its integrity, has 50-74% of its useful life remaining	Does not meet current design standards, or has substantial damage or deterioration that requires it to have major upgrade or replacement of components, has less than 20% of its useful life remaining
Operational Condition	Meets current engineering operational needs and standards	Is functional but has limited operational capabilities, not able to meet all of the desired needs of the system	Does not meet current operational needs, is obsolete, over capacity or malfunctioning due to component failures
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Detection System</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Physical Condition	Meets current engineering design standards, has no visible damage or deterioration, has 75% or more of its useful life remaining	Meets current engineering design standards, may have some deterioration due to age that does not affect its integrity, has 50-74% of its useful life remaining	Does not meet current design standards, or has severe damage that does not allow normal function and requires replacement, has less than 20% of its useful life remaining
Operational Condition	Meets current operational needs, provides detection 100% of the time 24/7 except during scheduled power outages	Has limited operational capability with respect to the needs of the location. Provides detection 100% of the time 24/7 except during scheduled power outages	Does not provide the needed functions or does not function consistently, needs to be replaced
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Traffic Management Center</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Physical Condition	Meets desired engineering design standards, and has room for expansion of new assets and operations	Meets current minimum engineering design standards, is limited in its expansion potential, Has some assets that have expended over half of their useful lives. Still provides the necessary functions required,	Does not meet current minimum design standards, or has substantial damage or deterioration that requires it to have major upgrade or replacement of components, has some components with less than 20% of its useful life remaining
Operational Condition	Meets current engineering operational needs and standards, has room for expansion of new operations, fully functional 24/7 or 100% of scheduled up-time	Is functional 24/7 or 100% of scheduled up-time, but has limited operational capabilities, not able to meet all of the desired needs of the Department	Does not meet current operational needs, is obsolete, over capacity or malfunctioning due to component failures
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Traffic Signal Assembly</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Physical Condition	Meets current engineering design standards, has no visible damage or deterioration	Meets current engineering design standards, may have some damage that does not affect its integrity	Does not meet current design standards, or has substantial damage or deterioration that requires it to have major upgrade or replacement of components
Operational Condition	Meets current engineering operational needs and standards, operates 24/7 except during scheduled power outages	Is functional but has limited operational capabilities, not able to meet all of the desired needs of the system	Does not meet current operational needs, is obsolete, over capacity or malfunctioning due to component failures
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset :	<i>Traffic Signal Communication System</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Physical Condition	Meets current engineering design standards, has no visible damage or deterioration	Meets current engineering design standards, may have some damage that does not affect its integrity	Does not meet current design standards, or has substantial damage or deterioration that requires it to have major upgrade or replacement of components
Operational Condition	Meets current engineering operational needs and standards,, functions 24/7 without failure except during scheduled shutdowns	Is functional 24/7 without failure but has limited operational capabilities, not able to meet all of the desired needs of the system	Does not meet current operational needs, is obsolete, over capacity or malfunctioning due to component failures
Summary:	Asset is rated at the lower condition rating for either of the essential characteristics		

Asset Class: Urban Forest

Asset :	<i>Landscaped Area</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Vegetation	Appropriate for the site to provide functional and environmental benefits with low to moderate levels of maintenance (30%)	Appropriate for the site to provide functional and environmental benefits but requires medium to high levels of maintenance (15%)	Inappropriate to provide functional and/or environmental benefits (0%)
Soil	Condition appropriate to support vegetation appropriate to the site (20%)	Condition requires amendment to support vegetation appropriate to the site (10%)	Condition does not support plant growth and/or is determined to be unacceptable or contaminated based on soil testing (0%)
Weed control	Requires low to moderate levels of maintenance with Integrated Pest Management (IPM) requiring little to no use of Tier 2 pesticides (20%)	Requires medium to high levels of maintenance with IPM requiring regular use of Tier 2 pesticides and/or minimal use of Tier 1 pesticides and/or labor-intensive mechanical methods (10%)	Requires medium to high levels of maintenance with IPM requiring regular use of Tier 1 pesticides and/or exposure to erosion (0%)
Site Suitability	Appropriate to support vegetation in a manner that provides public benefit that exceeds the cost to maintain it (10%)	Requires high maintenance to support vegetation in a manner that provides public benefits in balance with the cost to maintain it (5%)	Will not support vegetation and/or cost/benefit balance is lost due to high-cost maintenance practices to ensure public and/or employee safety (0%)
Irrigation	Functions to sustain plant growth in a manner that is consistent with City water conservation policies (20%)	Functions but does not adequately sustain plant growth and/or requires regular adjustment and/or partial replacement of system components and does not warrant full rebuild (10%)	Does not function and/or requires full system rebuild to function in a manner consistent with City water conservation policies (0%)
Summary:	Weightings assigned: Vegetation (30%), Soil (20%), Weeds (20%), Site suitability (10%), Irrigation (20%)		

Asset :	<i>Tree</i>		
Essential Characteristic	Rating		
	Good	Fair	Poor
Vigor – a measure of yearly stem elongation, leaf size, crown density, trunk integrity, and root integrity	80-100% of the standard for the species	50-79% of the standard for the species	< 50% of the standard for the species
Structure – a measure of decay, cracks or splits, deadwood, and branch attachment	0-20% of the crown involved	20-50% of the crown involved	> 50% of the crown involved
Infrastructure compatibility	Minimal conflicts with adjacent infrastructure, such as sidewalks, underground utilities and overhead conductors. Only routine maintenance of the tree is required for compatibility.	Conflicts are such that significant modifications to the tree or adjacent infrastructure are required. Not to exceed 40% root removal or 50% canopy removal.	Tree conflicts are such that other infrastructure cannot be modified and tree modifications cannot assure continued viability
Life expectancy	20+ years	5-20 years	< 5 years
Summary:	Weightings assigned: Vigor (30%), Structure (40%), Infrastructure compatibility (20%), Life expectancy (10%)		

Condition criteria for additional assets to be added as developed

Appendix D: Supporting Materials

The information and tables presented in this appendix provide supporting details about the status and condition of SDOT assets. This appendix was not updated for this report

Bridge Information:

Unfunded Bridge Maintenance Needs 2007

Annual Programs:					
Program Name		Program Description		Est. Cost (Thousands)	Priority
Bridge Painting Program		Corrosion protection of steel bridges		\$ 34,588	H
Annual Routine Maintenance Program		Annual routine repair of bridges		\$ 5,570	H
Bridge Maintenance Facility		Build bridge maintenance facility		\$ 4,800	H
Bridge Control System Replacement		Replace University Bridge control system		\$ 378	H
Bridge Seismic Retrofit Program – Phase 3		Seismic retrofit of high priority bridges		\$ 56,000	H
Bridge Vehicle Rail Safety Program		Rehabilitation of bridge rails		\$ 30,000	H
Total for Programs:				\$131,336	
Rehabilitation Projects:					
Bridge Name	Project Description	Features Intersected	Year Built	Est. Cost (Thousands)	Priority
SW Spokane St Viaduct	Widening (tied to RTID)	E Marginal Way 1 & 4 Ave	1941	\$ 70,000	H
Cowen Park Bridge	Rehab	Cowen Park Ravine	1936	\$ 8,500	H
Fauntleroy Expressway	Rehab	Harbor Ave	1963	\$ 3,600	H
Ballard Bridge	Rehab	Salmon Bay & RR	1940	\$ 5,600	H
West Seattle High-level Bridge	Deck Sealing	Duwamish River	1983	\$ 2,400	H
4 th Ave S Jackson to Airport	Rehab	Railroad Station	1910	\$ 2,700	H
Airport Way/Argo RR Yards	Main span replacement	Argo Railroad Yards	1928	\$ 32,700	M
Ravenna Park Pedestrian Bridge	Rehab	Ravenna Park Ravine	1912	\$ 2,100	M
Schmitz Park Bridge	Deck Sealing	Schmitz Park Ravine	1935	\$ 1,100	M
University Bridge N Approach	Rehab	NE Pacific St/E 40 th St	1930	\$ 3,600	M
W Emerson St Viaduct	Rehab	Railroad Tracks	1949	\$ 3,400	L
Colman Park Bridge #4	Rehab	Lake Washington Blvd/Bike Trail	1900	\$ 1,500	L
Colman Park Bridge #2	Rehab	Bike Trail	1900	\$ 1,500	L
Colman Park – Lakeside	Rehab	Bike Trail	1900	\$ 3,200	L
Colman Park Bridge #3	Rehab	Bike Trail	1900	\$ 1,500	L
E Boston Terrace Bridge	Rehab	Ravine	1948	\$ 9,300	L
Total for Rehabilitation Projects:				\$152,000	

Replacement Projects:				
Bridge Name	Features Intersected	Year Built	Est. Cost (Thousands)	Priority
Magnolia Bridge Viaduct	Smith's Cove & Railroad	1929	\$252,000	H
E Pine St Pedestrian Trestle	Gulch @ Madrona Drive	1949	\$ 3,200	H
Marion St Footbridge West	Midblock section of Overpass	1908	\$ 1,300	M
E Waterway (N bridge) Pedestrian Overpass	Duwamish River E Waterway	1944	\$ 8,000	M
Fairview Ave N – W Bridge	Lake Union	1948	\$ 17,000	M
2 nd Ave Extension S	Railroad	1928	\$ 20,500	M
E Interlaken Blvd	26 th Ave E	1912	\$ 3,400	M
Airport Way between 4 th & 5 th	Railroad Station	1910	\$ 43,000	M
Admiral Way N Bridge	Ravine, Fairmount Ave	1927	\$ 33,100	M
33 rd Ave W/Railroad Pedestrian Bridge	Rail Roads	1914	\$ 2,600	L
Washington Street Pier	Puget Sound	1920	\$ 2,400	L
Frink Park Bridge	Stream	1908	\$ 1,100	L
Total for Replacement Projects:			\$387,600	

**Bridge Painting Program
Bridges with Steel Elements**

Bridge Name	Last Year Painted	Next Proposed Painting
University Bridge	1993	2008
Airport Way S / Argo Railroad	1991	2019/2020
2 nd Ave S Extension	2005	2021
Fremont Bridge	1997	2012
Jose Rizal Bridge	1992	2007
Admiral Way S Bridge	2001	2019/2020
Ballard Bridge	1994	2010
20 th Ave N / NE 98 th St	1990	2016
Magnolia Bridge Viaduct	2002	2017
Airport Way / 4 th Ave – 5 th Ave	1989	2013
Yesler Way / 4 th Ave – 5 th Ave	1994	2014
1 st Ave S / Argo Railroad	1989	2013
Marion St Footbridge	2001	2016
Pike Place Hillclimb Pedestrian Bridge	1989	2019/2020
W Emerson St Viaduct	2005	2021
W Howe St Bridge	1995	2009
Ravenna Park (20th Ave NE)	2003	2019/2020
Mathews Beach Pedestrian Bridge	2004	2019/2020
S Spokane St Viaduct	1989	2015
N Queen Anne Dr Bridge	1996	2012
4 th Ave S / Argo Railroad	1998	2014
Washington Street Pier	1987 (spot)	2014
Galer St Flyover / 15 th Ave W Bridge	2003	2018

Retaining Wall Information:

Retaining Wall Priority for Replacement Costs in 2006 Dollars

Location	Length (Feet)	Date Built	Major Deficiency	Est. Cost (Thousands)
605 24 th Ave E at E. Mercer	183	1905	100 ft of wall has cracked and tilted; 73 foot portion of wall on 24 th Ave failed in 1989 and was temporarily replaced with ecology blocks; remaining 40 feet has cracked and tilted	\$ 756
1916 NE 125 th St	240	1971	Weathered, cracked and displaced rocks	\$ 1,440
15 th Ave NE & NE 130 th ST	300	1971	Bulging and cracking of rocks	\$ 210
1402 NE 125 th St	100	1971	Weathered, cracked and displaced rocks	\$ 60
E Boston at 15 th Ave	245	1910	Portion of retaining wall have moved out by about 3"; the paved street adjacent to displaced wall has also sunk	\$ 1,029
Poplar Pl S at S Dean St	50	1940	Tilting of wall	\$ 490
Aurora Ave N – between Galer St and Hayes St	200	1933	Bulging and weathering of rocks	\$ 100
Olson Pl SW & 3 rd Ave SW	250	1973	Bulging and weathering of rocks	\$ 150
Pedestrian bridge at Roxbury & 45 th Ave SW	40		Slope above bridge has moved to the bridge and is pushing it; some of the dirt has over-topped the bridge deck	\$ 240
Republican St between Eastlake & Yale Ave	145	1904	West end tilting & pushing against a house	\$ 870
8th Ave & Columbia St	117	1909	Wall tilting and has several cracks	\$ 702
49 th Ave SW & SW 98 th St	67	1955 & 1987	Wall slid in 1987 and was backfilled with light weight concrete. Early 1997, a crack developed on the roadway parallel to the wall.	\$ 402
Northlake Pl N & N 34 th St	120	1920	Three of the wall segments have tilted out and cracked	\$ 720
E Miller & 13 th Ave E	80	1911	Wall cracked horizontally and vertically, cracks as wide as 1". Top rail has moved, creating a gap from the road. Traffic impact on the rail is contributing to the movement of the wall	\$ 480
49 th Ave SW & SW 98 th St	67	1955	Tilting	TBD
14 th Ave W between Gilman & Wheeler St	78	1941	Settlement behind wall	TBD
1900 block of Brook Ave SW	50	1974	Cracks and settlement on road	TBD
Columbia St between 7 th Ave & 8 th Ave	135	1910	Tilting of wall	TBD
S Jackson St at 3 rd Ave S	58		Crack and displacement of wall	TBD
Upper Gilman Dr W & 14 th Ave W	120	1913	Tilting	TBD

Location	Length (Feet)	Date Built	Major Deficiency	Est. Cost (Thousands)
NE 98 th St at 20 th Ave NE	100	1987	Wall has undermined about 7 feet; may need 2 nd tieback as planned	TBD
38 th Ave SW & SW Andover St	320	1911	Tilting, corrosion on tieback system; non-standard guardrail	TBD
Terry Ave N between Thomas & Harrison St	372	1907	Rotation	TBD
8516 block of Sandpoint Way NE	70		Wall is covered with thick growth. The road above has long cracking and settlement	TBD
John St between Terry Ave N & Westlake Ave N	70	1943	Tilting and settlement of road	TBD
3 rd Ave W at W Fulton St	200	1923	Tilting	TBD
Total:				> \$ 7,649

Stairway Information:

Stairway Priority for Replacement

Location	Cross Streets	Date Built	Length (Feet)	No. of Treads	Est. Cost (Thousands)
Randolph Ave	Walington Ave & James St		117	101	\$ 100
18 th Ave SW	Charleston & West Marginal Way		328	228	\$ 150
SW Genessee St	21 st Ave SW & 22 nd Ave SW		98	74	\$ 60
SW Genessee St	2 nd Ave SW & 23 rd Ave SW		100	77	\$ 65
52 nd St	20 th Ave NE & 21 st Ave NE	1911	90	62	\$ 5
52 nd St	21 st Ave NE & 22 nd Ave NE		104	79	\$ 25
46 th Ave SW	Charleston & Andover		11	10	\$ 10
Bonair Dr SW	Alki Ave SW & Halleck Ave SW		168	109	\$ 168
Comstock St	Queen Anne & 1 st	1909	96	86	\$ 10
W Lee St	Willard & 6 th		23	2	\$ 3
20 th Ave NE	N of 98 th	1996	55	51	\$ 15
SW Massachusetts	Sturgus & 17 th Ave S		145	78	\$ 50
E Republican St	Melrose & Bellevue		117	90	\$ 10
Warren Ave	Ward & Ward		67	42	\$ 6
6 th Ave W	Comstock & Highland	1908	57	45	\$ 10
14 th Ave W	Raye		29	18	\$ 5
SW 21 st Ave	Genessee		4	14	\$ 25
N 88 th St	Meridian & Burke Ave N	1967	21	11	\$ 100
NE 95 th St	20 th Ave NE & Lake City Way	1981	153	108	\$ 100
Lee St	4 th Ave & 5 th Ave		34	25	\$ 100
S College St	Beacon & 13 th	1945	27	24	\$ 80
SW Raymond St	Atlas & 50 th	1945	86	76	\$ 400
53 rd Ave SW	Bonair Pl & Halleck Ave	1945	178	136	\$ 100
Brook Ave SW	SW Hill St		30	27	TBD
21 st Ave SW	Elmore & Commodore		10	9	TBD
Norman St	33 rd & Lake Washington Blvd		52	38	TBD
38 th Ave E	Newport & Union	1912	196	137	TBD
N 41 st St	Aurora & Aurora		82	73	TBD
52 nd Pl SW	Oregon & Genessee		49	30	TBD
8 th Pl W	7 th & 8 th		64	57	TBD
S Bayview St	MLK Way & 28 th Ave		78	54	TBD
45 th St	Palatine Ave N & 1 st Ave N	1916	62	33	TBD
Palatine Ave N	N 45th St & N 46 th St	1916	64	24	TBD
20 th Ave	98 th St & Creek		12	13	TBD
SW Kenyon St	14 th Ave S & 15 th Ave S				TBD
2 nd Ave N	Prospect & Highland	1980	81	66	TBD
25 th Ave E	Harrison & Thomas		16	14	TBD
31 st Ave	Cherry & Arlington		37	31	TBD
Total:					> \$1,597

Appendix E GASB-34 Reporting:

A major initiative undertaken by the Governmental Accounting Standards Board (GASB), which establishes requirements for the annual financial reports of state and local governments, may provide a significant impetus for state Departments of Transportation and local governments to deploy an asset management system.

In June 1999, GASB issued Statement No. 34, “Basic Financial Statements for State and Local Governments,” which requires state and local agencies to enhance the types of information provided as part of their annual financial statements in a manner more consistent with that used by private-sector companies and governmental utilities. Annual reports in compliance with the new rule will include financial statements prepared using full accrual-based accounting practices which reflect all of the government’s activities — not just those that cover costs by charging a fee for service.

This new approach will cover all capital assets and long-term liabilities, including infrastructure as well as current assets and liabilities. Accrual accounting reports all of the costs and revenues of providing services each year.

GASB recommends that state, city, and county government agencies, in reporting capital assets as part of their modified financial statements, use an historical-cost approach to establish transportation infrastructure values. If historical cost information is not available, GASB provides guidance for a proxy estimate using the current replacement cost.

Statement 34 indicates that governments may use any established depreciation method and identifies both straight-line depreciation and condition-based depreciation as acceptable. However, the GASB requirements indicate that infrastructure assets that are part of a network or subsystem of a network do not have to be depreciated if two distinct criteria are met — namely, if the government manages the infrastructure assets using an asset management system, and if the government documents that the infrastructure assets are being preserved at, or above, a condition level originally established for the assets. The asset management system should:

- Have an up-to-date inventory of assets;

- Perform condition assessment of the infrastructure assets at least once every three (3) years and summarize the results using a measurement scale; and

- Estimate the annual amount required to maintain and preserve the infrastructure assets at the condition level originally established for those assets.

Source: United States Department of Transportation (USDOT) Asset Management Primer

Appendix F: Glossary

Terms and acronyms used in this document:

Term/Acronym	Definition/Description
AC	Asphalt concrete over flexible base
AC/PCC	Asphalt concrete over Portland cement concrete or other rigid base
ADA	Americans with Disabilities Act
Asset Class	A grouping of Level 1 Assets that is based on commonality of function of the Asset
Asset Hierarchy	The decomposition of an Asset into its successive lower-level component Assets; the overall framework into which SDOT has organized its Assets
Asset Owner	A position in the SDOT organization that is recognized as the primary source of information and knowledge about capital investment needs, preservation, maintenance and operation of an asset.
Bike Boulevard	A shared roadway which has been optimized for bicycle traffic. In contrast with other shared roadways, bicycle boulevards discourage cut-through motor traffic but typically allow local motor vehicle traffic. Bike boulevards are designed to give priority to cyclists as through-going traffic
Block Face	One side of a street segment
Block Face Equivalent	2000 square feet
BST	Bituminous surface treatment, commonly referred to as Chip Seal
Catenary	Curve of cable; the curve adopted by a length of heavy cable, rope, or chain of uniform density, hanging between two points, or something with this shape; refers to the overhead cables associated with the streetcar system
CBD	Central Business District
CIP	Capital Improvement Program
Complete Streets	Resolution 30915 and Ordinance 122386 that define maintenance practices for SDOT assets
DBH	Diameter at Breast Height, or 4.5 feet; used as a standard measure of tree size
Encroachment	Non-permitted private use of the public ROW
GASB-34	Governmental Accounting Standards Board, Statement 34
Gore Area	The area of the roadway in-between two (2) diverging lanes before reaching a structural delineator
Lane-Line Mile	A measure of pavement marking that is equivalent to a 4" line of painting that extends one (1) mile in length
Level 1 Asset	The highest level of the physical Asset Hierarchy; the level at which investment decisions are commonly considered

Term/Acronym	Definition/Description
Movable Bridge	A bridge with one or more spans that open to allow passage of vessel traffic
PCC	Portland cement concrete
Real Property Asset	An item owned by SDOT that is of indirect value to the mission of SDOT or indirectly affects the delivery of SDOT services
Regulated Asset	ROW that is not yet improved but is regulated by SDOT; an item that exists in the ROW that is not owned by SDOT, but for which SDOT either shares liability or for which SDOT regulates the proper use
Replacement Value	The total cost in today's dollars to replace the physical inventory of an asset
ROW	Right of Way
RPAMIS	Real Property Asset Management Information System; an automated system operated by the Fleets and Facilities Department that contains asset data for SDOT buildings and parcels
Sight Triangle	A triangular area measured thirty (30) feet back from the point where two (2) curb lines meet if extended beyond the radius until they intersect at 90 degrees; used by Urban Forest staff to assure that plant material is pruned back from visual obstruction of vehicle operators
Spall	A section of concrete that cracks and separates from the larger concrete structure
Steel "H" pile & RC	Steel "H" pile refers to the shape of the steel pile that is used as a structural member of a retaining wall; RC is reinforced concrete
TCIP	Transportation Capital Improvement Program - Published in the City of Seattle's Capital Improvement Program, it includes a six-year plan for improvement and preservation projects for SDOT assets
TSP	SDOT Transportation Strategic Plan - The 20-year plan, describing the actions SDOT will take to accomplish the goals and policies in the City of Seattle's Comprehensive Plan and the Puget Sound Regional Council's Destination 2030 plans, and in support of Mayor Nickels' four (4) priorities for Seattle.